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COATING MADE OF A SYNTHETIC FILM, PROCESS AND DEVICE FOR PRODUCING THE SAME

~~Coating Consisting of a Synthetic Film,~~
~~Process and Device for Producing the Same~~

FIELD OF THE INVENTION

The invention concerns a coating consisting of a synthetic film made on the basis of at least one polymer material and an additive embedded in the matrix of the polymer material.

The invention also concerns a process for producing a coating, in which the polymer material is applied to the surface to be coated and is polymerized by the subsequent effect of energy.

The invention also concerns a device with an arrangement applying the polymer material to the surface being coated.

DESCRIPTION OF THE RELATED ART

The production of a composite material made up of a basic material and a generic coating applied to the surface of the basic material has been known for a long time from the state of the art. It is used to separate functions, whereby the coating takes on contact functions and the basic material carrier functions. The properties of this type of composite material can be varied for the respective application by the choice of materials, whereby the shape, stiffness and strength of the composite material are determined by the basic material and the surface properties by the coating.

The current practice is to produce the synthetic film based on a polymer material, like a duroplastic or thermoplastic material, for example, whereby additional components can be embedded in the matrix of the polymer material, which makes it possible to change the surface properties. Thus, for example, a piston-cylinder unit is known from EP 0667 931 B1 in which the inner surface of the cylinder of the piston is provided with a synthetic

layer, which contains at least one component for improving the dry-lubricating properties. This publication also discloses that a three-dimensional cross-linked duroplastic dust or powder is applied as the synthetic to the inner surface of the cylinder being coated and at least the duroplastic is then cross-linked by heating. Before it is applied to the inner surface of the cylinder being coated, additional components in the form of additives can be added to the duroplastic dust or powder, whereby at least one component improves the dry-lubricating properties of the inner surface of the cylinder.

But the disadvantage of the previously known composite materials is that the possibilities of purposely influencing the surface properties of the composite material that are determined by the synthetic film are insufficient to deal with the complex stresses on the composite material.

For example, in automated production, it is indispensably necessary to be able to determine the position of a workpiece both during the production process and after it, for example, for mounting purposes. Likewise, there are many cases in which the identification of a workpiece is of basic significance. These types of cases include checking for the presence of workpieces or components in inaccessible places, for example when mounted in automobile construction, technical safety aspects like, for example, anti-theft protection, motion sensing and the like.

For positioning workpieces, it is known from the state of the art how to use Reed elements, which are placed under the surface of the workpiece. It is also known in the state of the art how to measure the electrical resistance, which changes depending on the position of the workpiece, and there is an incremental principle whereby an electromagnetic sensor in the cylinder head scans special structures that are under a surface coating without touching them.

To identify the surfaces of workpieces not yet coated or those that have already gone through the coating process, it is known from the state of the art how to use bar-codes,

integrated circuits or oscillating circuits that are placed on the workpiece to be identified or on the surface of the workpiece to be identified.

The use of Reed elements, bar-code sensors and other electronic components does, however, have disadvantages. They must be placed on the respective workpiece or under the surface of it for positive determination or identification. Reed elements also have the disadvantage of only allowing one-dimensional position-finding.

In general, there is no process yet for economical, but also highly precise, industrial manufacturing in the state of the art to develop corresponding synthetic layers and optimize the synthetic layers for the respective application.

SUMMARY OF THE INVENTION

The objective of this invention is therefore to improve a coating for a basic material made out of a synthetic film in such a way that the surface properties determined by the synthetic film can be purposely predetermined and adjusted to the application, so the composite material can also be used when there are complex stresses.

Another aspect of this objective is to make it possible to identify workpieces and positioning on workpieces without using additional components and with simultaneously easy handling.

The technical solution to meeting this objective proposes that the synthetic film be made of several layer-like areas, at least one of which contains the property-changing components.

With the composite material in the invention, the first approach to the solution is therefore to propose that the synthetic film applied to the surface of the basic material be built of several layer-like areas and the layers be made with different compositions, whose properties can be adjusted independently of one another. Advantageously, it is also proposed that the individual layer-like areas be different from the embedded, property-changing components and/or the polymer materials used, whereby the properties

required in the individual areas can also be selected in terms of very complex stresses and can be application-specific.

Property-changing components, in the sense of this invention, means cross-linked or non-cross-linked additives embedded in the polymer matrix that improve, change or optimize the surface properties or the like, for example, influence its lubricating properties, its water-repellent property or the like.

Another advantageous proposal in the invention is to vary the concentration of the property-changing components embedded in a layer-like area in the direction of the layer thickness. Laying out the layer properties depending on layer thickness is an advantage, especially when a flowing transition should be made between two different layers or between the basic material and the first layer.

Another special advantage proposed is that the individual layer-like areas are arranged one on top of the another and/or next to one another following the surface contours of the basic material. By building layer-like areas arranged both one on top of another and next to one another, the production of stress-dependent layer properties is not limited only to the function-related site of the stress, but also can be adjusted depending on the depth effect of the stress.

The composite material in the invention has the advantage of making it possible to provide a basic material with a continuous synthetic film and thereby create a synthetic film that has a different structure in different areas and a different composition, and thus can be adjusted purposefully in terms of the properties required in the individual areas. Surface properties to be produced can be, for example: sealing capacity, scratch and impact resistance, tolerance to lubricants, dyes and hydraulic media, flow-mechanical properties, ability to be cleaned, hardness or ability to be recycled. There can be different polymer matrices in which different property-changing components are embedded in the different areas of the synthetic film. The individual areas can also be structured in single layers, whereby the concentration of embedded, property-changing components varies in

the direction of layer thickness. The layer-like design of the synthetic film and the possibility of purposely influencing the properties of the individual areas thus have the advantage of allowing application-specific property profiles to be created, so that a composite material is provided that can be used in many areas. Potential applications can be, for example, the food and pharmaceutical industries, environmental protection, connection and drive technology, shipping, fluid energy systems or the chemical and automobile industries.

The invention also proposes that the additive contain magnetizable particles, even if only one one-layer polymer matrix forms the film.

With the coating in the invention, it is also proposed embedding magnetizable particles in the matrix of the polymer material forming the synthetic film and thus making information-carrying areas in the coating. The magnetizable particles embedded in the matrix of the polymer material can be selectively magnetized, after a synthetic film is designed with the help of a corresponding electromagnetic read and/or write device. The synthetic film thus takes on not only the contact function known from the state of the art, such as protection from chemical or corrosive attack, but also serves at the same time as an information carrier, whereby any information can be recorded by the simple magnetization of the magnetizable particles embedded in the matrix of the polymer material. This information can then be read out and further processed on an electromagnetic read unit at a second site independent from the magnetization site.

Advantageously, the coating in the invention is also an information carrier that is in constant contact with the basic material. Information that can be stored and, if necessary, read out within the coating made from a synthetic film includes, for example, identification codes for identifying a workpiece and information for position-finding on a workpiece. It is an advantage that additional components that were necessary in the past for the identification or position-finding can be avoided. The coating in the invention makes it possible, for the first time, to use a synthetic film applied to the surface of a basic material as an information carrier as well. Thus, the formation of information-

carrying areas within the coating requires no additional manufacturing or work cycle, since the magnetizable particles placed in the synthetic film are embedded as such during the production process for the coating.

Besides workpiece identification and position-finding on a workpiece, the magnetizable particles in the coating can also be used to permanently store information for quality-assurance purposes. Thus, for example, information can be placed in the coating that tells about the manufacturing site, the manufacturing time or even geometric dimensions. Still within the manufacturing process, these data can then be read out for quality control and compared with corresponding standard variables. Advantageously, the information-carrying property of the coating is not visible from the outside and has no optical effect, so that the information placed in the coating can also remain on the workpiece after it is finished, which also permits later assignment. This is a special advantage in terms of guarantee obligations.

Besides the examples of applications given, many others are still conceivable. The deciding factor is that with the coating in the invention, for the first time a surface coating has been provided that takes on both contact functions for protection from outside influences and also information-carrying functions.

One feature of the invention is that the additive contains chromium dioxide as the magnetizable particles. The use of chromium dioxide has turned out to be an advantage inasmuch as chromium dioxide has favorable magnetization properties, on one hand, and is resistant in the magnetized state, on the other. Besides chromium dioxide, other magnetizable materials, like ferric oxide, for example, can be used.

Another feature of the invention is that the additive contains, besides magnetizable particles, additional components that change the properties. It is an advantage therefore to make a synthetic film that is designed purposely in terms of the stress to be expected.

Another feature of the invention is that the synthetic film is composed of several layer-like areas, which are different in terms of the embedded additive and/or the polymer material used. This makes it possible to create a synthetic film made of several layer-like areas which are different in their composition, and so their properties can be adjusted to the stress expected independently from one another. In terms of very complex stresses, properties can therefore also be purposely chosen and applications-specific. That way, areas can also be selected that contain no magnetizable particles, exclusively or in combination with other components, so that selective, area-wise magnetization of the coating is possible.

Another feature of the invention is that the concentration of additive embedded in the matrix of the polymer material varies. Such a variation in concentration can exist, for example, in the direction of the layer thickness, whereby the design of the layer properties, depending on the layer thickness, is an advantage when a flowing transition should be created between two different areas or between the basic material and the first coating area.

Another feature of the invention is that the individual layer-like areas are arranged over and/or next to one another. It is an advantage that as a result of this design, the production of stress-dependent layer properties is not limited exclusively to the function-related site of the stress, but can also be adjusted depending on the depth effect of the stress.

The coating in the invention has the advantage of making it possible to provide a basic material with an added synthetic film on the basis of at least one polymer material and hence to design a coating that has both a different composition and a different design in different areas and thus can be adjusted purposely to the properties required in the individual areas, and also can be selectively magnetized through the use of magnetizable particles and can therefore be used as an information carrier. The surface properties to be produced can be, for example: sealing capacity, scratch and impact resistance, compatibility with lubricants, dyes and hydraulic media, technical power properties and

the ability to be cleaned, hardened or recycled. Thus different polymer materials in different areas of the synthetic film have different polymer matrices, in which different property-changing components are embedded besides magnetizable particles. Of course, individual areas can also be structured in one layer, wherein a variation in the concentration of the embedded additive can occur both in the direction of layer thickness and also crosswise to it.

The layer-like design of the synthetic film and the possibilities of purposely influencing the properties in the individual areas also makes it possible, in combination with the possibility of information storage, to create applications-specific property profiles, so that a coating in the form of a synthetic film is available that can be used in many areas and that permits identification of the workpiece provided with the coating both during the whole production process and after it. Potential areas of application can be, for example, the food and pharmaceutical industries, environmental protection, connection and drive technology, shipping, fluid energy systems, the chemical and automobile industries or safety technology and stock protection.

In general, the coatings proposed in the invention contain property-changing components and/or magnetizable components.

One especially advantageous aspect of the invention is the multilayer design where stripping the upper layers in areas activates property components arranged on the lower layers. This stripping can be done by grinding, turning or other measures or a lower layer can be covered in areas when a top layer is applied. A coating can be formed by this aspect of the invention that has certain different properties or optimizations when looked at over the surface.

Another advantageous proposal in the invention is that the coated surface has structuring. For example, a spiral-shaped structure can be applied, in order to achieve optimal effects, for example interacting with a seal on a hydraulic system. The lubrication of a sealing ring can be optimized in a simple way by spiral-shaped surface stamping or by

comparable structuring. Other profiling for fluid transport, purposely forwarding fluid media or other media that may be fluid and designing sinks to form material depots and the like are possible within the framework of the invention. So-called roll embossing is mentioned.

With regard to the process mentioned at the beginning for the production of such a composite material, as the technical solution to the problem, it is proposed that the polymer material be applied forming layer-like areas depending on the property-changing components added.

To make the composite material in the invention, it is not necessary to treat the surfaces of the basic material to be coated for the application of the polymer material. However, all mechanical and/or chemical conversion methods can be used to produce certain properties. The basic materials capable of being used as the coating include all known metal construction materials (for example, iron, cobalt, copper, magnesium, titanium basic alloys) and ceramics and natural substances. Cast, forged, sintered or drawn, as well as rolled semifinished or finished products, can be coated.

Another advantageous proposal in the invention is that the polymer material is blended with the property-changing components and applied to the surface being coated in one work cycle. That way, layer areas with different composition and also locally different layer thicknesses can be produced in one coating process. Stress-dependent layer properties, both function-related and also depending on the depth effect of the stress, can be purposely set in one work cycle. Alternately, it is also possible for the property-changing components to be added before being applied to the surface being coated. In this alternative embodiment of the process, the matrix and embedding material to be applied are mixed together before being applied to the surface being coated and then applied to the basic material in layers in work steps that follow one another in a timed sequence.

According to another advantageous proposal in the invention, both the polymer material and the components to be embedded in the polymer material are applied in dust or powder form to the surface of the basic material being coated. Application in liquid form is also possible as an alternative.

According to another advantageous proposal in the invention, a combination of different polymer materials is used as the matrix material. Here, all polymer materials (thermoplastics, duroplastics, elastomers) can be used as the matrix material for the components being embedded. By combining different polymer materials into one matrix material, the properties of a layer-like area of the synthetic film can also be influenced in an advantageous way.

According to another advantageous proposal in the invention, components that are so crosslinked or not co-crosslinked can also be added as the property-changing components. Possible property-changing components are, for example, metallic and nonmetallic resins (for example, carbides, nitrides, oxides and non-oxides), solid lubricants (for example, graphite, carbon, MoS_2), pure metals (for example, iron, nickel, tin, copper) and alloys, as well as corrosion inhibitors. All embedding materials can be used in different grain sizes.

The synthetic film is made by heating and resultant cross-linking of the polymer material applied to the surface of the basic material being coated, with the addition of at least one property-changing component. The polymer material can be crosslinked by sufficient heating of the basic material being coated either before or after application of the polymer material. But, in each case, make sure that if magnesium is used as the property-changing component, the heating temperature is below approximately 200°C. In another advantageous proposal in the invention, the crosslinking of the polymer material can also be supported by using an electrostatic field or wavelength-specific portions of radiation.

In another advantageous proposal in the invention, layer-like areas with different layer thickness are made with the process in the invention. Thus, function areas with different

properties can be produced in the layers, and gradient materials can be produced with the thicknesses needed in relation to the layer thickness.

With the process in the invention, it is advantageously possible to produce a material compound whose polymer film is designed with locally different property profiles and profiles that change over the thickness of the layer. In this way, the properties of the polymer film can be made application-specific by a certain choice of matrix and embedding materials.

The invention also proposes that an additive containing a magnetizable particle be added to the polymer material to create a synthetic film that can be magnetized, at least in areas.

After the coating is done as described above, using the read and/or write devices, the magnetizable particles embedded in the individual areas of the synthetic film in the matrix of the polymer material can be magnetized and so contain information on the workpiece itself and other information, for example, for quality-assurance purposes.

According to another feature of the invention, a powder coating can be applied by the rotation or flock process using powder spray methods like flame spraying, plastic flame spraying or metal spray processing, in a whirl sintering bath and by electrostatic coating. For electrostatic powder coating, duroplastics and powdered paints made of epoxy, polyester and acrylic resins are especially suitable. In whirl sintering, on the other hand, thermoplastics made of PA, PVC or polyesters and polyepoxies are used. Application in liquid form is also possible as an alternative.

As described above, by combining different polymer materials into a matrix material, the properties of a layer-like area of the synthetic film can also be influenced in an advantageous way. Here, care must be taken that magnetizable particles as metallic hardeners do not represent crosslinking components and are therefore best suited for embedding in duroplastics. Different grain sizes can be used, depending on their ability to be magnetized.

The process in the invention makes it possible to produce coatings advantageously, wherein the polymer film is made with locally different property profiles and has areas that contain magnetizable particles embedded in the matrix of the polymer material for information storage.

The invention proposes a completely new type of application procedure. The desired thickness can be established for one layer or for each individual layer, and knowing the exact amount of spray, the amount applied can be controlled exactly with path-time controls in such a way that the amount applied to the workpiece gives the layer a precise thickness. A method is also proposed whereby the thickness can be measured without contact, for example using ultrasound. Since the workpieces are not preheated, after application, there is no crosslinking. For example, in the powder coating process, the amount of powder on the workpiece can be held by electrostatic loading. The thickness can be measured without contact, and a surface test can be done on optic and/or electronic paths, for example by image digitalization. Since there is no crosslinking, if there are defects the workpiece can be blown off and recoated. This method allows optimal control and is extremely economical.

The invention also proposes stripping top layers or preventing application to top layers by covering bottom layers, to activate the different property components of different layers in different areas. This stripping can also be done before or after crosslinking by grinding.

The invention also proposes structuring the surface, i.e., impressing or otherwise providing it with a structure, whereby ducts, sinks, passages and the like can be formed. Thus, for example, it is conceivable to perforate a top layer to make the water-absorbing and water-conducting properties of a bottom layer accessible, but to be able to use the dry lubricating properties of the top layer. In this process, the structuring can be done before crosslinking or before final solidification during hardening, so that process control is economical and advantageous overall.

The invention proposes process measures and advantages that make the process extremely economical and effective.

In terms of the device mentioned at the beginning, the technical solution to meeting the objective is that a feed direction is provided that blends the property-changing components with the polymer material.

The mixing of the different matrix and embedding materials necessary to form the layer is done in an advantageous way with the device in the invention. One advantageous proposal in the invention is to blend the property-changing components with the polymer material at the same time they are applied to the surface being coated, so that the mixture of matrix and embedding materials, as well as the layer-like application for producing different layer areas with different compositions is done in one step. In one alternative embodiment of the device in the invention, the matrix and embedding material are mixed by the feed device before being applied to the surface being coated.

In another advantageous proposal in the invention, a control device is provided that has a measurement device that detects the type and amount of property-changing components being fed in, gives a signal for that type/or amount, compares the signal to a predetermined reference variable and if they are the same ends the feed. The special advantage of such a control device is that the process of mixing the matrix and embedding materials can be automated and such a device is less prone to problems connected with synchronous application to the surface being coated.

The invention proposes a process and a device for carrying out the process to produce a composite material composed of a basic material and a synthetic film, which has the advantage of making it possible to make the synthetic film in layers, to develop application-related function areas and to produce property profiles that change with the thickness of the layer of synthetic film. In terms of mechanical – thermal – chemical –

electrochemical – complex stresses, the surface properties determined by the synthetic film can thus be adjusted to the respective application.

The invention also proposes that a feed device be provided that blends an additive containing magnetizable particles with the polymer material.

According to another feature of the invention, a magnetizing device is provided that selectively magnetizes the magnetizable particles embedded in the matrix of the polymer material. The magnetizing device, which is preferably composed of a read and/or write unit, makes it possible advantageously to magnetize directly the magnetizable subareas of the synthetic film forming the coating. This type of magnetization has the advantage that it can also be automated like the coating. In one alternative embodiment, it is also possible to use additives containing already magnetized particles to make a synthetic film, whereby the stored information can be read out by means of a corresponding read unit after coating for quality-assurance reasons.

The process in the invention and the device for carrying out the process in the invention propose producing a coating composed of a synthetic film made on the basis of at least one polymer material, and this makes it possible, for the first time, to embed an additive containing magnetizable particles and to use the coating thus formed as an information carrier as well. Information that can be stored by means of corresponding write units by selective magnetizing of the coating is, for example, information for identification, for position-finding, for quality assurance or for stock control. The special advantage of the coating in the invention consists of the fact that it performs both contact and information functions and can be produced in one step. Additional information components are now no longer necessary. The coating in the invention also offers the possibility of making application-related function areas and producing locally different property profiles and property profiles that can change in terms of the thickness of the synthetic film. In terms of mechanical – thermal – chemical – electronic – complex stresses, the surface properties determined by the synthetic film can thus be adjusted to the respective application.

For the device, a control unit is proposed in which the amount applied and hence the predetermined desired layer thickness can be produced economically. According to another proposal, the device also includes a unit for measuring the thickness without contact, for example an ultrasound measurement unit.

Advantageously, the device in the invention can have a unit for structuring the surface.

Other details and advantages of the invention will be given in the following description with the drawings.

BRIEF DESCRIPTION OF THE INVENTION

Fig. 1 is a schematic sectional view of a composite material consisting of a basic material and a synthetic film;

Fig. 2 is a schematic detailed view of a function area of the synthetic film in Fig. 1;

Fig, 3 is a schematic sectional view of a magnetizable coating according to the invention and

Fig. 4 is a schematic detailed view of a function area in Fig. 3.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Fig. 1 shows, in a schematic sectional view, a composite material consisting of a basic material 1 and a synthetic film 2 formed on the basis of several different polymer materials. The synthetic film 2 is, in turn, made up of several layer-like areas, which are arranged next to one another following the contours of the basic material and form the function areas A, B, C and D. The synthetic film 2 also contains property-changing components embedded in the matrices of the polymer material.

The individual layer-like function areas A to D of the synthetic film 2 are different in terms of the property-changing components embedded in the individual function areas and/or in terms of the polymer materials used. Thus, for example, the synthetic film in

function area A is composed of a polymer material with the matrix structure M1. The property-changing components E1, E2 to Ex are embedded in this polymer material in a concentration of C1, C2 to Cx. The synthetic film 2 is built in function area B as in function area A on the basis of a polymer material with the matrix structure M1, but unlike function area A contains only one property-changing component Ey in concentration Cy. In function area C, the synthetic film 2 is composed of a polymer material with the matrix structure M2. In this function area, no property-changing components are embedded in matrix M2 of the polymer material. Function area D of the synthetic film 2 is, finally, like function area C, built on the basis of the polymer material with matrix structure M2. Unlike function area C, however, in function area D, property-changing components Ex are embedded in concentration Cx and Ez in concentration Cz in matrix M2..

In the example of embodiment in Figure 1, the surface state of the basic material 1 produced is turned due to the machining in function areas B to D and also ground in function area A. However, basically a special surface treatment of the basic material 1 is not necessary before applying a synthetic film 2.

Fig. 2 is a schematic detailed view showing the structure of function area A in Fig. 1. Here it is clear that function area A is made up of different layer-like areas I to X, which are arranged over one another following the surface contours of the basic material. Like individual function areas A to D, these individual layer-like areas I to X differ in terms of the property-changing components embedded in these areas and/or the polymer materials used. In this example of application in Figure 2, the synthetic film 2 in the individual areas I to X is built on the basis of the same polymer material with matrix structure M1. In terms of the property-changing components embedded in the matrix M1 of the polymer material, however, the layer-like areas I to X are different. Thus, the first sublayer 1 contains component E1 in concentration C1, sublayer II contains component E2 in concentration C2, sublayer III component E3 in concentration C3, and sublayer X finally component Ex in concentration Cx.

The structure of the synthetic film 2, given in Figures 1 and 2 as an example, shows, in an advantageous way, the combination of different polymer and embedding materials that are applied to one and the same basic workpiece formed into a coherent synthetic film 2, which has a different composition and a different structure in different function areas.

Fig. 3 is a schematic sectional view showing a magnetizable coating B according to the invention that was applied to a basic material G. The coating B is composed of a synthetic film formed on the basis of at least one polymer material.

Coating B is made up of several layer-like areas, which are arranged next to one another following the contours of the basic material and form function areas A, B and C. These function areas of coating B are different both in terms of the individual additives embedded and also in terms of the polymer materials used. The concentration of embedded additives can also vary. In the figures, polymer materials are marked according to their matrix structure M, additives Z and the concentration C. Thus, for example, coating B in function area A is composed of a polymer material with matrix structure M1, in which additives Z1 and Z2 are embedded in a concentration of C1 and C2, respectively. These are magnetizable particles in additive Z1. In function area A, the coating B can be magnetized by corresponding magnetizing devices, so that this area of the coating can also be used as an information carrier. Coating B is structured in function area B just as in function area A on the basis of a polymer material with matrix structure M1, but contains, unlike function area A, only additive Z2 in a concentration C2 and has no magnetizable particles. This area of the coating B is not magnetizable with it. In the last function area C of coating B, the synthetic film is made of a polymer material with the matrix structure M2. Within this function area, no additive materials are embedded in matrix M2 of the polymer material.

In the example of embodiment in Figure 3, the surface state of the basic material G that has been produced is turned in function areas A and B by machining and is also ground in function area A. Basically, however, a special surface treatment of the basic material G is not necessary before applying the coating B.

Figure 4 is a schematic detailed drawing showing the structure of function area A in Figure 3. Here, it can be seen that function area A is made up of different layer-like subareas A1 to A4, which are arranged over one another following the surface contours of the basic material. Like the individual function areas A to C in Fig. 1, the individual layer-like subareas A1 to A4 differ in terms of the additives embedded in these areas and/or polymer materials used. In the example of application in Fig. 2, the coating B in function area A is placed in individual subareas A1 to A4 on the basis of the same polymer material with matrix structure M1. In terms of the additives embedded in the matrix M1 of the polymer material, however, the individual subareas A1 to A4 differ. Thus, the first sublayer A1 contains additive Z2 in concentration C2, subarea A2 contains additive Z2 in the same concentration as in subarea A1, plus additive Z1 in concentration C1. Additive Z1 contains magnetizable particles, but additive Z2 is an additive improving the corrosion properties of coating B. Subarea A3 contains, finally, as additive Z1 only magnetizable particles in concentration C1. Sublayer A4 directly above it contains, unlike the sublayers A1 to A4 arranged over it, no more additives and is made up exclusively of the polymer material with the matrix structure M1.

The embodiment of the magnetizable coating B given as an example in Figures 3 and 4 shows, advantageously, the combination of different polymers and additives that are formed into a cohesive coating B applied to one and the same basic material G in one step, with a different composition and a different structure in different function areas, whereby the magnetizable particles embedded in function area A make it possible to use the coating as an information carrier as well.

List of References

B	coating
2	synthetic film
G	basic material
1	basic material
A,B,C	function area
A1...Az	subarea
M1..Mz	matrix structure
Z1...Zz	additive
C1...Cz	concentration
C1...Cz	property-changing components